

CLAIMS

1. A device adapted to facilitate the inserting of objects under a folded roof (1) in a rear boot (2) of a motor vehicle, the roof (1) being movable between a deployed position in which it covers the passenger compartment of the vehicle, and a folded, stored position in which the roof (1) is stored and retracted into the boot (2), and comprising a rear roof element (3) and at least one additional roof element (4 and 5) which is located in front of the rear roof element (3) when the roof (1) is in the deployed position, and above the rear roof element (3) when the roof (1) is in the folded position, the rear roof element (3) comprising a finger bar (11) adapted to slide along a guiding rail (7) which is fixed to the body (9) of the vehicle and which comprises a storage section (12) adapted to guide the roof (1) between its deployed position and the folded, stored position, and a raising section (17) extending along the storage section (12) and adapted to guide the folded roof (1) between its folded, stored position and a folded, raised position in which, the hood (15) of the boot (2) being in the open position, the folded roof (1) at least partially projects out of the boot (2), the device comprising a raising device (16) mounted in a movable manner between a low position and a high position, and adapted to guide the finger bar (11) along the raising section (17), wherein a securing means (23) is fitted to the raising device (16) in a movable manner between an open position and a closed position in which the securing means (23) is adapted to support each additional roof element (4 and 5) and to immobilise each additional roof element (4 and 5) with respect to the rear roof element (3), when the roof (1) is moved between its folded, stored position and its folded, raised position.

2. The device set forth in claim 1, wherein the securing means (23) is located behind to and in the immediate

vicinity of the additional roof elements (4 and 5) when the roof (1) is in the folded, raised position.

3. The device set forth in claim 1 or 2, wherein the
5 securing means (23) is rotary mounted with respect to the raising device (16), around an axis of rotation (24) transversal to the vehicle and located behind the additional roof elements (4 and 5) when the roof (1) is in the folded position.

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4. The device set forth in any one of claims 1 to 3, wherein a groove (22) integral to the body (9) is used to guide the end of the raising arm (16) adjacent to the securing means (23).

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5. The device set forth in any one of claims 1 to 4, wherein the securing means (23) comprises, on its front face (25) and for each additional roof element (4 and 5), a recess (26 and 27) adapted to receive, in the closed position, a stub
20 (28 and 29) which is integral to the corresponding additional roof element (5 and 4).

6. The device set forth in claim 5, wherein it comprises, for each additional roof element (4 and 5), a
25 bearing surface (44 and 43) adapted to support the corresponding additional roof element (4 and 5) when the securing means (23) is in the open position and the roof (1) is in the folded, stored position.

30 7. The device set forth in claim 6, wherein each recess (26 and 27) is delimited by an upper side wall (41 and 42) and by a lower side wall (39 and 40) which projects forward past the corresponding upper side wall (41 and 42) and which defines the corresponding bearing surface (43 and 44).

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8. The device set forth in claim 7, the additional roof elements (4 and 5) being constituted of a central roof element

(4) and a front roof element (5) which is located in front of the central roof element (4) when the roof (1) is in the deployed position, and above the central roof element (4) when the roof (1) is in the folded position, wherein the additional roof elements (4 and 5) are arranged so that, when the roof (1) is close to its folded, stored position, the stub (29) of the central roof element (4) is located further forward than the stub (28) of the front roof element (5) so as not to push against the bearing surface (43) of the stub (28) of the front roof element (5).

9. The device set forth in claim 6, wherein all the bearing surfaces (43 and 44) are located on a support element (45) which is fitted to the raising device (16) in a movable manner between an admission position and a reception position in which each bearing surface (44 and 43) is adapted to support the corresponding additional roof element (4 and 5) when the roof (1) is in the folded, stored position.

10. The device set forth in claim 9, wherein the support element (45) is, in relation to the raising device (16), fitted in a movable manner in rotation around an axis of inclination (46) transversal to the vehicle and located in retreat of the additional roof elements (4 and 5) when the roof (1) is in the folded position.

11. The device set forth in claim 9 or 10, the additional roof elements (4 and 5) being constituted of a central roof element (4) and a front roof element (5) which is located in front of the central roof element (4) when the roof (1) is in the deployed position, and above the central roof element (4) when the roof (1) is in the folded position, wherein the support element (45) comprises a lower leg (47) and an upper leg (48) fixed to each other, each being adapted to respectively define the bearing surface (44) of the central roof element (4) and that (43) of the front roof element (5), when the support element (45) is in the reception position.

12. The device set forth in any one of claims 9 to 11, wherein activating means (49) are used to bring into contact the support element (45) and to guide it from its admission
5 position to its reception position.

13. The device set forth in claim 12, wherein said activating means (49) comprise the stub (29) of the central roof element (4) which is used to bring into contact the lower
10 leg (47) when the support element (45) is in the admission position and when the roof (1), whilst folding, is in the transmission position adjacent to its folded, stored position, and to guide the support element (45) until it reaches its reception position when the roof (1) moves from its
15 transmission position to its folded, stored position.

14. The device set forth in any one of claims 9 to 13, wherein means for returning (50) constantly bear on the support element (45) in its admission position, the means for
20 returning (50) comprising, for example, a spring (50) of which a first end is fixed to the support element (45) and of which the second end is fixed to the raising device (16).

15. The device set forth in claim 9, wherein, when the
25 roof (1) is in the folded, stored position, the securing means (23) is in the closed position and the support element (45) is in the reception position, each stub (28 and 29) is inserted into a cavity (51 and 52) defined by the corresponding bearing surface (43 and 44) of the support element (45) and the
30 corresponding recess (26 and 27) of the securing means (23).

16. The device set forth in any of claims 1 to 15, wherein controlling means (30) are used to bring the securing means (23) into contact therewith and to guide it from its
35 open position and its closed position.

17. The device set forth in claim 16, wherein the controlling means (30) are disposed on the rear roof element (3).

5 18. The device set forth in claim 17 dependent on claim 5, wherein the controlling means (30) comprise a push button (32) mounted so as to be movable in a straight line with a guide (33) fixed to the rear roof element (3), between a normal position and a stop position in which the securing
10 means (23) is in the closed position, and adapted to come into contact with a contact surface (34) located on the front face (25) of the securing means (23).

15 19. The device set forth in claim 18 dependent on claim 3, wherein the axis of rotation (24) is located between the contact surface (34) and the recesses (26 and 27).

20 20. The device set forth in claim 18 or 19, wherein a nut (35), fixed to the push button (32), is used to co-operate with a threaded end (36) of a rotative arm (37), so as to
20 guide the push button (32) in a straight line according to the direction of the arm (37).

25 21. The device set forth in claim 20, wherein an end of the arm (37) opposite the threaded end (36) is integral to a motor (38) fixed to the rear roof element (3).

30 22. The device set forth in any of claims 1 to 21, wherein means for returning (31) constantly bear on the securing means (23) in its open position, the means for
30 returning (31) comprise, for example, a spring (31) of which a first end is fixed to the securing means (23) and of which the second end is fixed to the raising device (16).

35 23. The device set forth in any of claims 1 to 22, wherein the deployment arm (6) is connected to the rear link arm (13) linking the rear roof element (3) to the adjacent,

additional roof element (4), by means of a gearing mechanism (53) and in that a disengaging mechanism (58) is used to disengage the deployment arm (6) from the gearing mechanism (53).

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24. The device set forth in claim 23, wherein the gearing mechanism (53) comprises an upstream sprocket (54) which is fixed to an end of the deployment arm (6) and which is rotary mounted to the rear roof element (3) around a hinge
10 line (10), a downstream sprocket (55) which is fixed to an end of a rear link arm (13) by which the rear roof element (3) is linked to the additional roof element (4) adjacent to it, and which is rotary mounted to the rear roof element (3) around an
15 axis of transmission (56), and a central sprocket (57) which is rotary mounted to the rear roof element (3) and which is driven by the upstream sprocket (54) and the downstream sprocket (55).

25. The device set forth in claim 24, wherein the end of
20 the deployment arm (6) adjacent to the hinge line (10) comprises an orifice (59) and the upstream sprocket (54) comprises a complementary orifice (60) which is located at a right angle to the orifice (59) when the roof (1) is in the folded, stored position.

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26. The device set forth in claim 25, wherein a retaining pin (61) is fitted in a movable manner into the orifice (59) and the complementary orifice (60) between an
engaged position in which it penetrates into the orifice (59)
30 and the complementary orifice (60) so as to secure the upstream sprocket (54) to the deployment arm (6) when the roof (1) is guided between its deployed position and its folded, stored position, and a disengaged position so as to disassociate the upstream sprocket (54) from the deployment
35 arm (6) when the roof (1) is guided between its folded, stored position and its folded, raised position.

27. The device set forth in claim 26, wherein the retaining pin (61), driven by a motor (62), is fitted in a straight line perpendicular to the vehicle.

5 28. The device set forth in any of claims 1 to 27,
wherein the hinge line (10) around which the rear roof element
(3) is fitted in a movable manner to the deployment arm (6)
guiding the roof (1) between its deployed position and its
folded position and the swivel axis (19) around which the
10 raising device (16) is fitted in a movable manner to the body
(9) are coaxial when the roof (1) is in its folded position.